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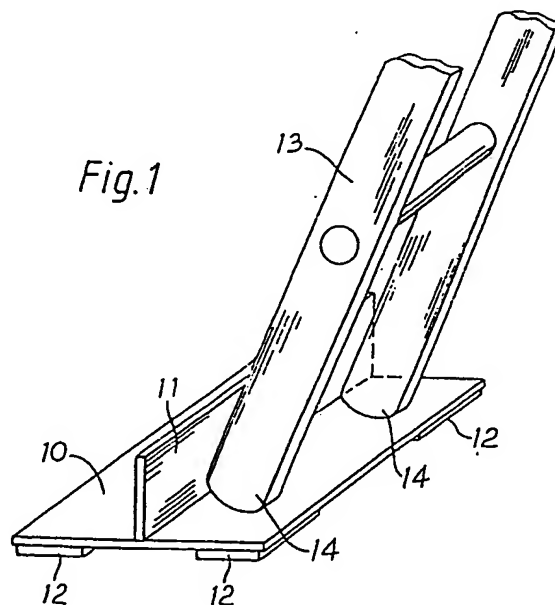
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(54) Ladder stabiliser.

(57) A stabiliser for the lower end of a ladder (13) comprises a rigid, generally flat base plate (10) and one or more aligned linear projections (11) extending upwardly from the upper surface of the base plate (10), the overall length of the projections (11) being at least sufficient to engage the base of the ladder (13), and the lower surface of the base plate (10) being of enhanced frictional value. For example, the base plate may have rubber pads (12) secured to its lower surface or it may be enclosed in rubber.



Description

Ladder Stabiliser

The present invention relates to a stabiliser for a ladder.

The difficulties and dangers inherent in the use of ladders have been recognised and received attention for many years. Accidents which have occurred include those attributable to sideways slip of the upper end of a ladder and those in which the foot of the ladder has slipped in a direction away from the wall or other structure against which the ladder has been used.

Numerous devices have been proposed for imparting increased stability to ladders, many of which have been concerned with stabilising the upper end of a ladder. Devices for stabilising a ladder at its lower end have also been proposed and mostly take the form of attachments to the individual ladder feet. Lower-end stability continues to pose problems, however, mainly as a result of the very wide range of different surfaces upon which a ladder may be required to stand. For example, a ladder may need to be used upon soft soil or hard ground, upon flat surfaces or rough surfaces, and in wet or dry conditions. Available devices may have to be attached for use only on certain types of surface and removed for other surfaces and may be suitable for attachment to ladders of a certain size only.

It is an object of the present invention to provide a ladder stabiliser which is more versatile in use than many prior such stabilisers, while being simpler in design and use than many such stabilisers.

The ladder stabiliser according to the present invention comprises a rigid, generally flat base plate and one or more aligned linear projections extending upwardly from a first, upper surface of said base plate, the overall length of said projection(s) in a direction along said surface being at least equal to the width of the lower end of a typical conventional ladder, and the second, lower surface of said base plate being of enhanced frictional value. This very simple stabiliser is, in use, placed upon the ground or other surface upon which the ladder is intended to be stood, with the length of the projection(s) disposed transverse to the intended direction of the length of the ladder, and the ladder is then erected in its intended position to use with the ladder feet located in the angle between the base plate and the projection(s).

The base plate may be square, rectangular or of any other desired, preferably regular, shape in plan but preferably the base plate is generally rectangular with its longer axis in the direction of length of the upstanding projection(s).

Extending upwardly from the base plate are one or more aligned linear projections. Thus, for example, there may be two such projections, one to engage each foot of the ladder. However, it is much preferred that there should be just one said projection and, for the sake of succinctness, further description hereinafter will refer to a single upstanding projection. Nonetheless, it is emphasised that the following description could be applied to two or

more such projections where appropriate.

Conveniently the projection is disposed substantially centrally relative to the width of the base plate, so that the stabiliser may be reversed without effect, which is a beneficial deterrent to involuntary misuse. However the projection may be located nearer to the forward or rearward edge of the base plate if desired. In one less-preferred form of the stabiliser, the projection may even be disposed along one edge (the rearward edge) of the base plate.

The projection preferably extends upwardly substantially perpendicular to the base plate but may be inclined relative to the perpendicular if desired, for example by an angle not exceeding 30 degrees to the perpendicular.

The base plate and the projection may be formed separately and then secured together, as by bolts or by welding, but conveniently they may be formed as a single unit. Thus the base plate and projection may be of the same or different materials. Preferably they are of the same material and are formed in a single piece.

Thus, for example, the base plate and the projection may both be formed in iron or steel and bonded together by welding. As one much preferred alternative, the base plate and projection are formed in a single piece, for example of aluminium or a suitable rigid plastics material, and may be produced by extrusion or by moulding. Particularly where the base plate and the projection are produced together by extrusion, it is advantageous to form linear ribs upon the projection, extending throughout the length of the latter.

The projection may conveniently and advantageously be of such length that it extends substantially from one end of the base plate to the opposite end and this form of the stabiliser lends itself readily to manufacture by extrusion. However, the projection may also be shorter than the corresponding length of the base plate, subject to the condition that the length of the projection should be at least sufficient to engage the base of a ladder. Thus the projection is preferably about 40 to 60 cm. long, more preferably 40 to 50 cm. long.

The lower surface of the base plate is of enhanced frictional value and this effect may be achieved in various ways. For example, the base plate may be formed with a generally roughened lower surface or with regular or irregular serrations or other projections thereon. In a preferred alternative form of the present invention, frictional material, for example natural or synthetic rubber or other polymeric material, is secured to at least the lower face of the base plate to enhance the frictional properties of the latter. Thus, for example, that lower face may be covered with a sheet of rubber adhesively secured to it or a number of discrete pads of rubber may be secured to the lower face of the stabiliser, for example four such pads at the respective corners of a rectangular base plate. The upper surface of the base plate may similarly be covered, or partially

covered, with frictional material. In a particularly preferred form of the ladder stabiliser according to the invention, the whole of the base plate, but preferably not the projection, may be enclosed in frictional material. This has the important advantages of not only improving the grip of the upper surface of the base plate but also of securing the frictional material most effectively to the base plate.

Frictional material secured to the lower surface of the base plate in one of the foregoing ways may itself be given improved surface gripping properties such as by providing a tread or other profiled surface thereon.

While one important feature of the ladder stabiliser according to the invention is that it may be of very simple construction and may readily be interchangeably used with ladders of different sizes, nonetheless the stabiliser may, if desired, be attached to the lower end of the ladder, in order to provide additional security against inadvertent or wilful misuse of the stabiliser or to give the user greater confidence in using the device.

The invention will now be further described with reference to the accompanying drawings, wherein:-

Fig. 1 is a perspective view of a first embodiment of the ladder stabiliser according to the present invention, in use to stabilise the foot of a ladder;

Fig. 2 is an end elevation, to a slightly larger scale, of the stabiliser shown in Fig. 1;

Fig. 3 is a perspective view of a second, preferred embodiment of the ladder stabiliser according to the present invention; and

Fig. 4 is a transverse cross-sectional view of the ladder stabiliser of Fig. 3.

The ladder stabiliser shown in Figs. 1 and 2 is formed of steel sheet and comprises a rectangular base plate 10 and an upstanding linear projection 11, running along the centre-line of the base plate and welded to it. Secured to the underside of the base plate 10 by adhesive are four rectangular rubber pads 12.

The device is used as shown in Fig. 1. The stabiliser is placed upon the ground at the appropriate place for the base of the ladder and the ladder 13 is then stood with the feet 14, 14 of its two side-rails or stiles abutting the angle of the base plate and projection. The pads 12, assisted by the weight of the ladder and of a user upon the ladder, give a good grip upon the ground surface and greatly reduce the risk of the ladder slipping. Because of the nature of the pads 12, the gripping effect may actually prove to be better on a wet surface than on a dry one.

The second, preferred embodiment of the ladder stabiliser illustrated in Figs. 3 and 4 is used in the same manner as that of the first illustrated embodiment but is more readily manufactured on a large scale and also demonstrates even better performance in use. In this form of the stabiliser, the base plate 20 and the upstanding projection 21 are produced as a continuous extrusion, seen in cross-section in Fig. 4. The extruded profile includes alternating continuous ribs 22 and troughs 23 running the full length of the projection 21.

When the extrusion has been cut to a length of

about 45 cm to form the base plate 20 and the projection 21, a synthetic rubber covering 24 is moulded and vulcanised in situ around the base plate. Into the upper surface of the rubber covering 24 are moulded discontinuous channels 25, while the underside of the stabiliser is formed with an embossed thread or similar shaped surface (not shown in the drawings).

While, in the drawings, two specific embodiments of the invention have been illustrated, the ladder stabiliser may take various other forms, as described above, and the illustrated embodiments may themselves be modified. While, for example, the stabiliser of Figs. 1 and 2 has been shown as having a generally smooth upper surface, that surface of the base plate may be roughened or coated to improve the resistance to sideways slip of the ladder feet over its surface. Furthermore, the non-coated surfaces of each embodiment may be given a protective or preservative coating, since the stabiliser may be used primarily out-of-doors.

The stabiliser according to the invention, especially in its illustrated forms, conveys many advantages. Of course most important is that, in normal use of the ladder, the stabiliser reduces significantly any tendency of the foot of the ladder to slip away from the wall or the like against which the ladder is being used. A secondary advantage is that, without the stabiliser, there may be a tendency for the user to place a ladder in an unduly vertical position, which in fact tends to reduce the stability of the upper end of the ladder against the lateral slip. By using the stabiliser, the user may more readily be persuaded to erect the ladder in a more suitable, less vertical position.

Three further advantages may be mentioned. Firstly, the fact that the projection is linear has been found to assist alignment of the stabiliser parallel to a wall, so that the ladder when erected is more likely to be placed in a proper, truly stable position, without the tendency to rock which can otherwise occur. Secondly, even in extreme positions where the angle of the ladder is such as to tend to make the stabiliser slip away from the wall, any resulting slip is usually non-catastrophic, the stabiliser rather tending to "slip-and stick", thus giving warning of an unstable condition.

The third further advantage arises when a lone user is attempting to erect a long ladder without assistance. Conventional practice is to place the foot of the ladder against the foot of the wall and then to elevate the other end of the ladder using the wall-foot as a stop. That practice cannot safely be adopted when working in a limited area such as a narrow pavement, since the horizontal starting position for the lift would involve the ladder projecting into the adjacent roadway. However, using the stabiliser of the present invention as the stop for the foot of the ladder, the ladder can be lifted in a direction along the pavement parallel to the wall, before eventually being swung through 90 degrees about a vertical axis when it has been lifted upright.

In experiments carried out to test the benefit of the stabiliser of Figs. 3 and 4 in resisting slip of a ladder away from a wall, it was established that the

distance from the wall of the foot of the ladder at which slippage begins may be increased by as much as 20 to 30 per cent in some cases. Experiments were carried out on, among other surfaces, a polished wooden floor, painted slate tiles, dry concrete, wet concrete and newly-painted concrete. On each of these surfaces, a significant improvement was obtained and the onset of slippage took the form of the "slip-and-stick" tendency referred to above.

Claims

1. A stabiliser for the lower end of a ladder, characterised in that it comprises a rigid, generally flat base plate and one or more aligned linear projections extending upwardly from a first, upper surface of said base plate, the overall length of the projection or projections being at least sufficient to engage the base of a ladder, and the second, lower surface of said base plate being of enhanced frictional value.

2. A ladder stabiliser according to claim 1, characterised in that the base plate is generally rectangular in plan and the projection(s) are disposed generally parallel to the longer axis of the base plate.

3. A ladder stabiliser according to claim 1 or 2, characterised in that the projection(s) are disposed substantially centrally relative to the width of the base plate.

4. A ladder stabiliser according to any of the preceding claims, comprising a single said projection which is substantially perpendicular to the base plate.

5. A ladder stabiliser according to claim 4, characterised in that the base plate and projection are formed in a single piece by extrusion.

6. A ladder stabiliser according to any of the preceding claims, characterised in that the overall length of the projection or projections is of the order of 40 to 60 cm.

7. A ladder stabiliser according to any of the preceding claims, characterised in that a frictional material is secured to the lower face of the base plate.

8. A ladder stabiliser according to claim 7, characterised in that the base plate is enclosed in said frictional material.

9. A ladder stabiliser according to claim 7 or 8, characterised in that the frictional material on the lower face of the base plate has a tread or other profiled surface.

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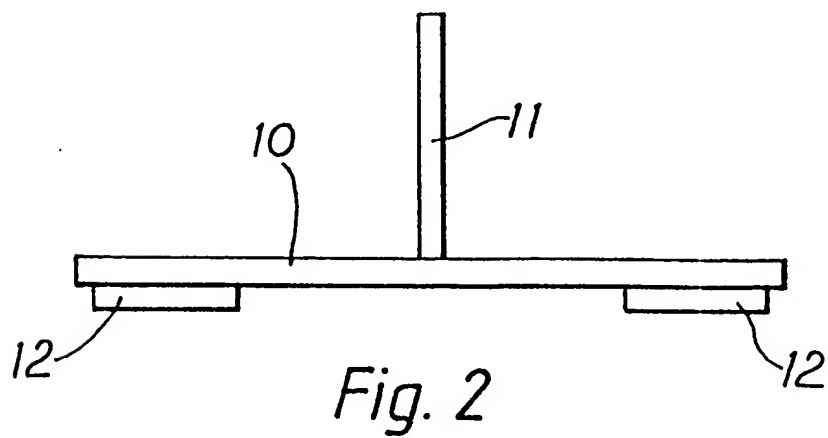
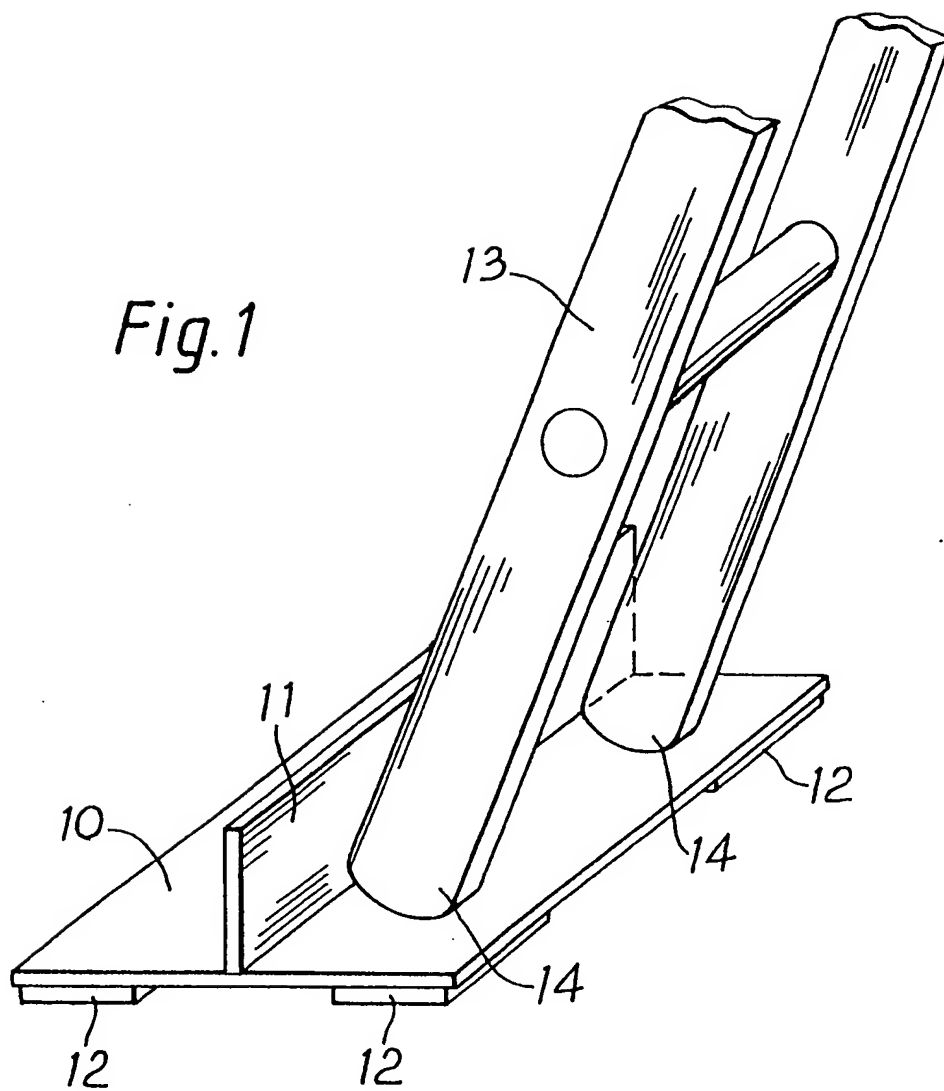


Fig. 3

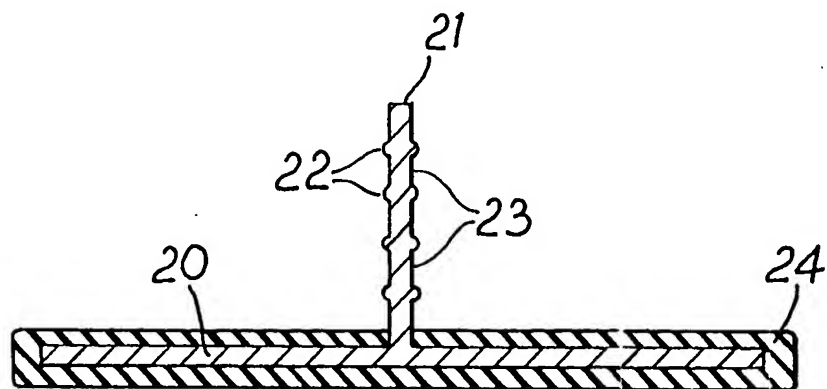
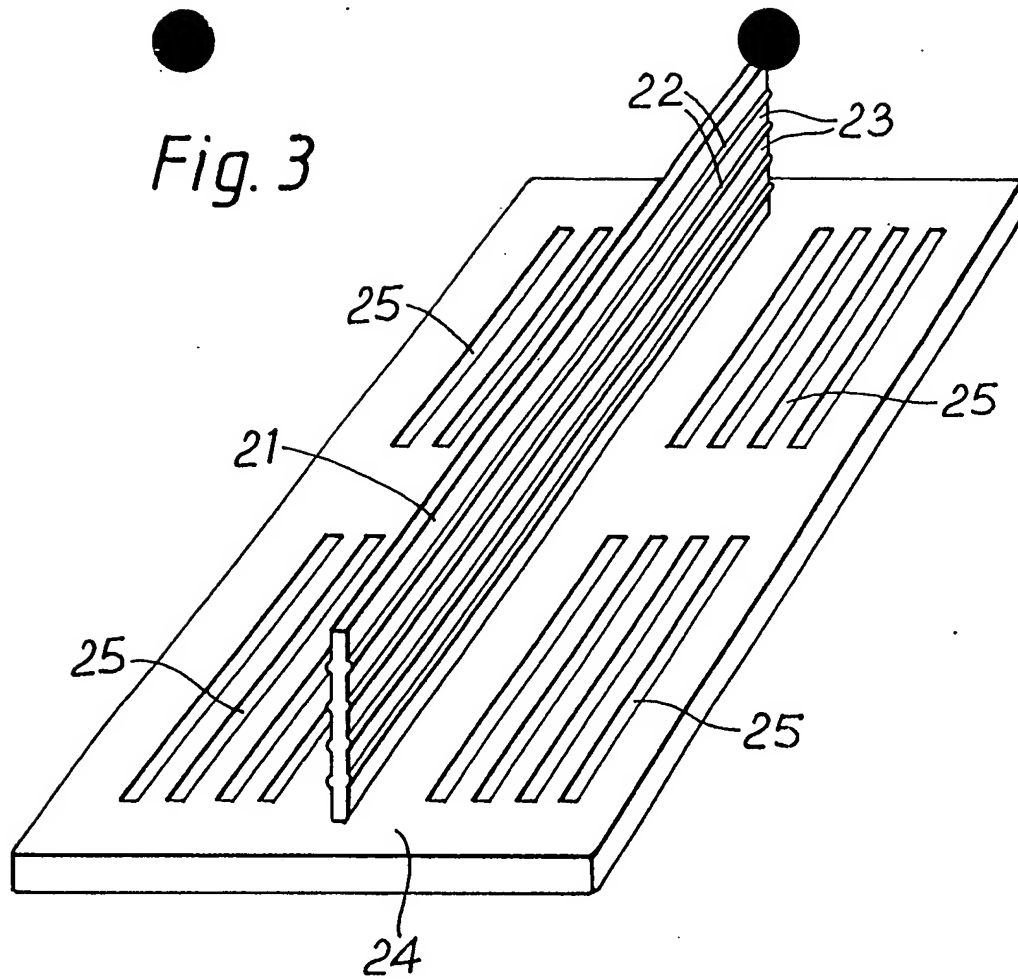


Fig. 4



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	GB-A-2 142 076 (ROBERTS) * Page 1, lines 93-118; figures 1,2 *	1,7	E 06 C 7/42
Y	---	2-4,6,9	
Y	GB-A-1 367 489 (PARKINS) * Page 1, lines 26-37,54-73; page 2, lines 11-43; figures 1,2 *	2,3,4,6	
Y	---		
Y	DE-U-8 517 589 (MIDDELBERG) * Page 5, paragraphs 2-5; figures 5-7 *	9	
X	---		
X	GB-A-2 160 570 (CRABBE) * Page 1, lines 112-130; figures 3,4 *	1-4,7	
A	---	6	
A	DE-C- 450 827 (DEPPE) * Page 1, lines 22-45; figures 1,2,4 *	1,2,4,7	
A	---		
A	GB-A-2 057 040 (SHAYNE) * Whole document *	1,2,4,5 7,9	
A	---		
A	GB-A- 260 980 (HEARN) * Figures 1,3,4,5 *	1,7,8	TECHNICAL FIELDS SEARCHED (Int. Cl.4) E 06 C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 28-04-1989	Examiner HENDRICKX X.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			